II. DESCRIPTION OF THE PROPOSED ACTION

A. PURPOSE

This environmental impact statement (EIS) is issued to provide environmental guidance for the research and development program that is proposed to be carried out at the Savannah River Plant (SRP) and its subcontractors related to long-term management of the high-level radioactive waste generated at SRP as part of the Nation's nuclear defense program. Twenty-three alternatives for long-term management of the SRP waste had earlier been analyzed as to applicable technology, probable costs, and risks in *Alternatives for Long-Term Management of Defense High-Level Radioactive Waste* (called the DWD). This programmatic statement is based in part on the technical information in the DWD[1] and in an earlier EIS on interim waste management at SRP.[2] It adds to this earlier material an assessment of the full range of environmental impacts associated with implementation of three of the alternative plans.

The research and development (R&D) is necessary for implementation of the alternatives outlined in Section I that involve processing the waste to an immobile form for storage onsite or offsite. One of the other alternative plans, continued tank farm operation, does not require the research and development work being a continuation into the future of present waste management practices at SRP. This alternative is the "No Action" case,* but will hereafter be referred to as "Continued Present Action." The remaining alternative plan, disposal of liquid waste in a bedrock cavern at SRP, would require extensive research and development, but this work is not currently proposed for funding.

The purpose of this environmental impact statement is to analyze the environmental implications of the proposed continuation of a large Federal R&D program to develop methods for immobilization of the SRP wastes. The EIS analyzes the environmental effects that would occur if the R&D program is followed by actual implementation of one of the alternative plans based on such research and development.

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* "No Action" is terminology used in regulations issued by the Council on Environmental Quality.

B. POLICY AND OBJECTIVES

It is the policy of the Department of Energy to conduct research and development, testing, and design work with sufficient breadth and lead time to ensure that whichever of the most promising alternatives is selected for long-term management of defense waste, it can be implemented on a timely basis. This work is carried out with full public disclosure through public reports, information meetings, and environmental impact statements. The DOE policy is promulgated to achieve the following broad objectives:

- To supply the knowledge needed to isolate the waste from the environment for long enough or in a secure enough manner that it will pose negligible risk to human welfare.

- To encourage early public participation in the decision process, which must necessarily involve social and political consideration in addition to technical factors.

C. SHORT-TERM AND LONG-TERM BENEFITS EXPECTED FROM IMPLEMENTATION

The proposed research and development program will have the short-term benefit of providing a more sound technical and financial information base if the alternative of conversion of the waste to an immobile form is implemented. These efforts are focused on areas that require the greatest depth of new knowledge or that require long lead times for resolution.

D. RELATIONSHIP TO HANFORD AND IDAHO DEFENSE WASTE PROGRAMS, AND TO POSSIBLE FUTURE COMMERCIALLY GENERATED WASTE

Besides the SRP wastes, DOE also has high-level waste (HLW) management operations at both its Hanford site (near Richland, Washington) and its Idaho site (near Idaho Falls, Idaho). In addition, there is commercial high-level waste stored at the NFS plant near West Valley, New York and a possibility of additional commercial HLW generation if nuclear fuels reprocessing is ever resumed in the U.S. DOE has issued documents describing its current HLW management operations at Hanford[3] and Idaho,[4] the alternatives for long-term management of the high-level defense waste at the Hanford and Idaho sites,[5,6] and the alternatives for the long-term management of the high-level commercial wastes.[7,8] Close cooperation and information exchange on plans for management is maintained between SRP and the other HLW programs. Some of the proposed research and development activities for SRP wastes are applicable to the waste management alternatives at more than one site. However, many such activities are site-specific because of differences in chemical and physical forms of the existing wastes.

The most fundamental technical reason for pursuing separate programs at each of the waste sites is the fact that is not currently believed desirable to ship raw waste between sites for processing at another site. The waste at the different sites also has different properties. The Hanford, NFS, and SRP high-level wastes are the most similar, all being alkaline wastes, but they were generated from different fuels and by different separations processes. The Idaho and commercial wastes are intrinsically different acid wastes.

These differences in waste properties require development of processes tailored to each type of waste. Furthermore, a major part of the proposed Savannah River program is devoted to removal of the waste from tanks and processing to the point where a high-integrity form can be made. This part of the process is not applicable to commercial or Idaho waste, and it is only partially applicable to the Hanford waste because some of the Hanford tanks contain hardened sludge and/or may have potential leaks if slurrying liquids were introduced to the tanks. Information exchange is carried out among all the high-level waste programs, with the Savannah River Operations Office acting as a coordinating lead office. Duplication of research and development effort is avoided except where DOE management judgment indicates that duplication is desirable.

The Savannah River program is large enough on both economic and time scales to be a stand-alone project, and justifies optimization as such. The alternatives now in development would require about 14 years after startup to work off existing waste

and become current with the ongoing waste generation rate. It will require a capital cost expenditure of about $3-4 billion (1980 dollars).

Environmental impact statements will also be issued for long-term waste management at the Idaho and Hanford sites at an early stage in their R&D and decision-making processes.

E. EXCLUSION OF SAVANNAH RIVER WASTES OTHER THAN HIGH LEVEL FROM THIS DOCUMENT

The low-level wastes (LLW) and transuranic wastes (TRU) at Savannah River are in different initial forms than the high-level waste, and are likely to be disposed of in different final forms. Therefore, separate programs must be developed to handle each type of waste. The possibility does exist, however, that incinerator ash from the LLW or TRU programs could be incorporated into the high-level waste forms. The volume and activity of any such material would be a small fraction of the material in the high-level program, and would therefore not influence the major decision process. Alternatives for long-term management of the TRU wastes at SRP are discussed in separate documents, currently under review by DOE.

F. SEQUENTIAL LONG-TERM HLW MANAGEMENT DECISIONS FOR SR, ID, AND RL

The research and development program proposed for continuation is aimed at having SRP to be the first U.S. site implementing a high-level nuclear waste immobilization program, with the other waste sites then following sequentially. The reasons for this decision are as follows.

- On a technical basis, the Idaho program for immobilization into a calcine acceptable for storage onsite is already well under way. There is no immediate technical or public acceptance reason for additional processing of this waste into glass or other advanced waste form at this time.

- The waste in tank storage at Savannah River is in a form that is easier to retrieve than the Hanford tank waste, and there is no danger of leaks to the environment from the addition of slurrying liquid to the Savannah River tanks during the removal process. Furthermore, the Savannah River R&D, design, and testing programs for both removal of the waste and subsequent processing are more advanced in time than those at Hanford.

- There will be some advantages from implementation experience that will accrue to the overall efficiency of the waste management program if the defense sites proceed sequentially in their immobilization programs.

An economic consideration is that funding for the total defense waste program will require several billion dollars. Spreading this expenditure over a longer time span by sequential implementation will provide Congress with a budget request having the least impact on other programs.

G. HISTORY OF REVIEWS OF THE LONG-RANGE WASTE MANAGEMENT PROGRAM AT SRP

The long-range waste management program at the Savannah River Plant (SRP) has had the benefit of reviews and recommendations by consultants and independent organizations. A short history of these reviews and the program decisions that were made based on them is presented here.

1. NAS (Through 1965)

From 1955 to 1965, the Committee on Geologic Aspects of Radioactive Waste Disposal of the National Academy of Sciences - National Research Council (NAS-NRC) served as advisor to the Division of Reactor Development and Technology of the U.S. Atomic Energy Commission. The Committee's responsibility to that Division was to observe and study critically the research and development activities of the Division with respect to radioactive waste disposals in the ground, and to provide counsel regarding the safety of the Division's current and proposed operations insofar as they are affected by geologic considerations.

Although its specific delegated responsibilities were the geologic aspects of the research and development program of the AEC's Division of Reactor Development and Technology, the Committee concerned itself with all phases of ground disposal of radioactive wastes and drew conclusions on overall waste management practices.

The Committee consisted of eight members who changed from time to time as earlier members were replaced by new ones. For the four meetings that concerned SRP, only one member was on the Committee continuously, and five were appointed just prior to the last meeting in 1965.

In September 1955, a conference was held at Princeton University at which 65 scientists representing many branches of earth sciences, biology and medicine, chemistry, physics, engineering, and other pertinent fields of knowledge considered various problems of radioactive waste disposal on land and offered suggestions toward their solution. The primary proposed disposal methods which developed from this meeting were disposal in salt, deep-well disposal in permeable formations, and conversion of liquid wastes to

solids. Although this conference did not directly involve SRP, it set the stage for later conclusions by the Committee about proposed SRP waste storage programs.

In March 1960, the Committee met to consider a proposal to investigate the safety and feasibility of storing radioactive waste in facilities excavated in bedrock beneath the plant site. The Committee recommended that SRP proceed with test borings, and that the project then be reconsidered after the results of the tests were available. In addition, AEC asked the U.S. Geological Survey, the U.S. Bureau of Mines and the U.S. Army Corps of Engineers to assist in the design of the investigation in a consulting capacity.

In December 1961, after one test well was complete and three others started, the NAS-NRC Committee met at the Savannah River Plant to review the progress of the investigations and to make specific suggestions on the direction of the exploratory boring program.

The drilling and testing program for bedrock storage was finished in December 1962, and the results were included in an AEC report that was published in 1964 (Reference 9). The conclusion of this report was that storage of liquid radioactive wastes in excavated chambers was technically feasible. No further investigative program was outlined.

In June 1963, the NAS-NRC Committee met in Washington, D.C., to review bedrock storage. They concluded that for long-term safety, underground disposal at this locality is much better than storage in surface tanks, and that work be started on the next phase of the program. The Committee expressed concern that the hydrologic disturbance caused by the exploration drilling may have invalidated some of the hydrologic tests, and recommended that hydrologic observations should be continued until a state of equilibrium could be conclusively established. The Committee's review is given in Reference 10.

From 1964 through 1966, the U.S. Geological Survey carried on numerous hydrologic tests in the already existing bedrock exploration holes.

On April 12-13, 1965, the Committee with a different membership visited the Savannah River Plant to review the status of the bedrock waste storage project which had been carried on at a very low level during the intervening two years. This visit was one of an itinerary in which all of the major AEC production sites were visited to review their research and development programs on radioactive waste disposal to the ground.

The reviews and recommendations resulting from these visits are contained in a report to the Division of Reactor Development and Technology dated May 1966.[11] In regard to the bedrock waste storage exploration at the Savannah River Plant, a majority of the Committee recommended that the program be discontinued but a minority recommended that the program continue, outlining specific lines of investigation that should be pursued. Most of the Committee additionally recommended that high-level waste not be stored above freshwater aquifers. After much consideration of the recommendations as well as alternative programs for long-term containment of waste, the AEC decided to pursue the program outlined by the minority of the Committee. Comments on this report are contained in a letter from the Director of the Division of Reactor Development and Technology to the President of the National Academy of Sciences.[12] After the issuance of its report in May 1966, the Committee on Geologic Aspects of Radioactive Waste Disposal, NAS-NRC went out of existence.

2. GAO

In May 1968, the General Accounting Office reported on a review of high-level radioactive waste management. After reviewing conditions and programs at each site where high-level waste storage exists, GAO concluded that AEC needed to devote more vigorous attention to advancing the technology required to permit long-term storage at the Richland and Savannah River sites. This report is Reference 13. As a result of this report, SRP began a study of the Triassic bedrock nearer the Savannah River, and employed a consulting firm to independently review bedrock storage, and to develop concepts for the storage vault.

In January 1971, the General Accounting Office again reviewed the high-level radioactive waste management programs of AEC and concluded in its report:[14] "Although AEC has assigned a high priority to radioactive waste management problems, GAO believes that the level of effort given to these programs should be increased in view of their extraordinarily complex characteristics. The problems and delays being experienced are attributable primarily to a need for more definitive technology on such matters as the relative merits of alternative practices and proposals for interim and long-term storage."

In a June 1979 report, the General Accounting Office outlined the recommendations of an Interagency Review Group (IRG) to the President (March 1979) and concluded: "We believe the recent IRG effort is a good start toward establishing a viable Federal program for long-term nuclear waste management."[15]

3. S. C. Legislature

In May 1971, the South Carolina State Legislature adopted a resolution establishing a "committee to study the establishment of plants or facilities for the recovery of nuclear fuel and the

storage of waste nuclear materials." A report on its findings was published in 1972.[16] One of the recommendations of the committee was "that South Carolina authorities oppose ultimate permanent storage of high-level radioactive waste in South Carolina because testimony given this committee up to this point in time indicates there are other more suitable locations for such storage."

4. Consultant Panel

In the fall of 1968, Du Pont convened a panel of six consultants in the fields of geology, hydrology, geochemistry, and civil engineering to review bedrock storage and all of the work to date, then to advise on the direction of the program. If the Panel recommended continuance, they were also expected to provide overall directions to the program. The Panel concluded in a May 1969 report:[17] "As a result of all these deliberations, the Panel is of the judgment that the bedrock storage proposal has sufficient promise of offering a permanent solution to a critical waste handling problem to warrant a major step forward in construction. At the same time, the explorations which have taken place over the past years make clear that a definitive assurance that bedrock storage would provide complete and permanent safety to the public can only be provided by the actual construction of the shaft and several of the tunnels. Such a procedure is essential to disclose the number and degree of fissures or fractures which will be encountered, in fact, at the depth under consideration. The Panel strongly recommends, therefore, the construction of the shaft and appropriate tunnels."

During the period 1969 to 1971, additional information became available on the Triassic rock, a low porosity sandstone-claystone, that was known to exist in the southeast one-third of the plant site. This rock is extremely impermeable and did not evidence any fractures, which were a source of concern in the crystalline metamorphic rock due to the difficulty of mapping them using test wells. The Du Pont consulting panel suggested that more exploration be done on the Triassic rock and reviewed the existing information in a progress report dated December 10, 1971.[18] After this information had been developed, the most suitable host rock would be selected for further exploration with a shaft and test tunnels.

5. NAS (Present Committee)

In March 1968, a Committee on Radioactive Waste Management was created by NAS-NRC to advise the Atomic Energy Commission, rather than only one division of AEC, on long-range radioactive waste management plans and programs. This committee sponsored

a Panel on Bedrock Disposal to review that program specifically; the abstract of that Panel's report is as follows:

> The highly radioactive wastes aged in tanks at the Savannah River Plant (SRP) site must ultimately be transferred to some facility that offers effective retention for centuries. A solution under consideration is to store these wastes in vaults in the rocks deep beneath the site.
>
> For such long-term retention of radioactive wastes, an unprecedented degree of precise information is needed on the hydrologic systems in the bedrock, on the regional stress fields, on the structural integrity of mined openings, and on the chemical compatibility between the wastes and potential host rocks. It is also apparent that this needed degree of precision cannot be adequately obtained by exploration from the surface supplemented by a limited number of borings. This statement in no way diminishes the usefulness of the exploration from the surface, the chemical and physical tests, borings, and hydrologic calculations so far made. It reflects, rather, the fact that the metamorphic basement rocks, and the sedimentary rocks of Triassic age underlying the site, are neither uniform nor homogeneous and cannot be evaluated with precision from limited samples. The information acquired to date indicates a potential for a safe storage facility, but, in view of the intensity of the radioactivity of the material to be stored and the length of time required, the only prudent course is thorough exploration before final decision. The recently acquired data on the sedimentary rocks of Triassic age are encouraging and emphasize the need for complete exploration.
>
> Information from *in situ* exploration of the potential host rocks will be essential for development of an environmental-impact statement. Such *in situ* exploration is possible only by the construction of a shaft to the proposed depth and the excavation of tunnels.
>
> The proposed shaft and tunnels would serve several purposes. First, and most critical, such exploratory excavations would permit the examination and study of the host rock throughout the extent of the proposed vaults. Extrapolation of rock conditions from the walls of a small tunnel to a full-sized vault is reasonably certain, in contrast to the less certain extrapolation of rock conditions from borings hundreds of feet apart. Also, it will be possible to make chemical and physical analyses of the rock throughout the entire dimension of the proposed vaults. Further, before the final decision is made

to develop a full-scale storage facility, exploratory excavations will make possible observation of water movement in the host rock over a significant period. In addition, digging an exploratory shaft would identify the problems of engineering design and construction in penetrating the highly permeable water-bearing Tuscaloosa Formation that overlies the basement rocks. Because this is a primary regional aquifer, there must be assurance that a watertight shaft can be constructed through it and can be maintained.

The decision as to whether the exploratory shaft should be located in the metamorphic rocks or in the Triassic sedimentary rocks will depend on results of geological, geophysical, and geochemical investigations yet to be completed. Preliminary data suggest that the Triassic rocks are not extensively fractured, but the presence and spacing of joints and faults would be disclosed by the lateral tunnels. The physical, chemical, and engineering properties of the Triassic rocks are not adequately known, and exploratory excavations would facilitate their thorough study. If data from the exploratory shaft and tunnels do not clearly confirm that use of excavated vaults is safe for long-term isolation of SRP wastes from the biosphere, the concept as herein defined would become invalid.

The Committee on Radioactive Waste Management reviewed the report of the Panel on Bedrock Disposal and endorsed the following conclusions and recommendations:[19]

1. The Panel on Bedrock Disposal has reviewed the pertinent information on management of high-level radioactive wastes now stored in tanks at the Savannah River Plant site. It concludes that the current interim procedure of tank storage is acceptable for short-term containment but is not acceptable over the hazardous radioactive life of the wastes.

The Panel recommends that efforts toward development of permanent storage facilities be continued.

2. The Panel has reviewed alternative methods of radioactive waste processing and storage.

Whatever method is adopted, the Panel recommends that it be capable of protecting the biosphere from these wastes for not less than 1,000 years.

3. The Panel concludes that there is a reasonable prospect of achieving such protection by storing the wastes in vaults in rocks underlying the Tuscaloosa Formation beneath the Savannah River Plant site. This conclusion refers only to wastes that have been aged a minimum of 10 years. The underlying rocks include two major kinds, Triassic sedimentary rocks and older metamorphic rocks; safe storage may be possible in either one.

To guide underground exploration and permit a choice between the Triassic sedimentary rocks and the metamorphic rocks, the Panel recommends additional field and laboratory investigations. These investigations must produce definitive information as to the three-dimensional characteristics of the two rock units that underlie the prolific, water-bearing Tuscaloosa formation. Particularly important is information on (a) the fluid transmissivity of different parts of the two rock units, (b) the hydraulic gradients within the rocks of Triassic age, (c) the ion-exchange capacities of the two units, (d) the chemical reactions between the waste and the potential host rock, and (e) the regional stress fields in the two units.

4. The Panel concludes that no reasonable amount of exploration from the land surface can conclusively demonstrate the safety of waste storage in deep vaults. Essential for such a demonstration is *in situ* inspection and testing of the rocks in which vaults might be constructed.

Accordingly, the Panel further recommends that an exploratory shaft be sunk and exploratory tunnels be driven in the rock selected.

5. The recommended experimental program is intended to develop the information that would permit an orderly analysis of all factors relevant to safety and environmental considerations.

The Panel recommends that a systematic framework for accumulation of the required data be established in conjunction with the design of an exploratory shaft and tunnels.

6. Study of the recommended exploratory shaft and tunnels may indicate that the proposed deep vault storage at SRP would not be acceptable. Since some long-term alternative to tank storage is needed, concurrent research and development of alternative waste-management procedures are necessary.

The Panel recommends that the U.S. Atomic Energy Commission continue vigorously to investigate alternative methods of fixing and storing wastes.

7. Study of the recommended exploratory shaft and tunnels may indicate that the proposed deep vault storage at the SRP is acceptable.

In this case, the Panel recommends that a competent and impartial review be made of this additional information before the decision is made to charge the vault with waste.

6. Bedrock Explorations

Based on the recommendations of the Du Pont Consulting Panel, which were later concurred in by the NAS-NRC Panel, that the next step of exploration was the construction of an exploratory shaft and tunnel, a consultant architect-engineering firm was retained. Realizing that this storage facility, if constructed, would have requirements beyond that of ordinary rock tunnels the consulting architect-engineer was asked first to make a broad scope review of all of the information so far developed for an additional expert opinion on the feasibility and safety of the project.

This preliminary study of available data[20,21] concluded that the probability of the feasibility of the concept of storing radioactive wastes in bedrock tunnels is enough to warrant continuation of programmed and recommended studies of hydrology, rock mechanics, chemistry, and thermal considerations. It also concluded that "with data from 'above ground' studies only, it will not be possible to state conclusively that the overall project objective is feasible. The host rock must be penetrated with man-sized exploratory shafts in order to permit detailed inspection and *in situ* testing. Only after conducting, analyzing, and synthesizing the results of such *in situ* investigations will it be possible to reach a definitive conclusion."

Two other reports were produced by the consultant architect-engineering firm[22,23] on specific technical aspects of the program - deep shaft studies and the results of Triassic Exploration Drilling.

A draft environmental statement was prepared in January, 1972, to provide information on environmental impacts of a bedrock waste storage exploration program.[24] This statement covered impacts of sinking the exploratory shaft and tunnels and carrying out a data collection program. If the data were favorable for implementation of an actual waste disposal program in the bedrock, other environmental impact statements would have been written to cover the full-scale facility and the effects of disposal of radioactive wastes there.

In November 1972, active investigation of bedrock storage of radioactive waste was indefinitely postponed while major effort

was turned toward alternative methods of waste storage such as temporary, near-surface storage in a solidified form. The AEC made this decision because of concerns about proving the integrity of bedrock for the period required for waste disposal as well as the advisability of disposing of high-level waste in an area with a large aquifer expressed by the States of Georgia and South Carolina. The press release on this decision is given in Reference 25, and a Federal Register notice announcing cancellation of the environmental statement is given in Reference 26.

H. REFERENCES FOR SECTION II

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2. *Final Environmental Impact Statement, Waste Management Operations, Savannah River Plant.* Report ERDA-1537, Energy Research and Development Administration (September 1977).

3. *Final Environmental Statement, Waste Management Operations, Hanford Reservation.* Report ERDA-1538, Energy Research and Development Administration (December 1975).

4. *Final Environmental Statement, Waste Management Operations, Idaho National Engineering Laboratory.* Report ERDA-1536, Energy Research and Development Administration (June 1976).

5. *Alternatives for Long-Term Management of Defense High-Level Radioactive Waste, Idaho Chemical Processing Plant.* Report ERDA-77-43, Energy Research and Development Administration (September 1977).

6. *Alternatives for Long-Term Management of Defense High-Level Radioactive Waste, Hanford Reservation.* Report ERDA-77-44, Energy Research and Development Administration (September 1977).

7. *Western New York Nuclear Service Center Study Final Report for Public Comment.* Report TID-28905-1, U.S. Department of Energy, Washington, DC (November 1978).

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8. *Technology for Commercial Radioactive Waste Management.* Report DOE/ET-0028, U.S. Department of Energy, Washington, DC (May 1979).

9. *Storage of Radioactive Wastes in Basement Rock Beneath the Savannah River Plant.* USAEC Report DP-844 (1964).

10. Letter John C. Frye to Walter Belter: "Minutes of June 1963 Meeting of Committee on Geologic Aspects of Radioactive Waste Disposal," (July 17, 1963).

11. *Report from Committee on Geologic Aspects of Radioactive Waste Disposal, NAS-NRC to Division of Reactor Development and Technology* (May 1966).

12. Letter Milton Shaw to Dr. Frederick Seitz: "Comments on Report from Committee on Geologic Aspects of Radioactive Waste Disposal, NAS-NRC to Division of Reactor Development and Technology, USAEC, May 1966," (November 7, 1966).

13. *Observations Concerning the Management of High-Level Radioactive Waste Material.* Report from the Comptroller General to the Joint Congressional Committee on Atomic Energy (May 1968).

14. *Programs and Problems in Programs for Managing High-Level Radioactive Wastes.* Report from the Comptroller General to the Joint Congressional Committee on Atomic Energy (November 1970).

15. *The Nation's Nuclear Waste — Proposals for Organization and Siting. Report from Comptroller General to the Subcommittee on Energy,* Nuclear Proliferation and Federal Services, Senate Committee on Governmental Affairs. EMP-79-77 (June 21, 1979).

16. *Report of the Committee to Study the Establishment of Plants or Facilities for the Recovery of Nuclear Fuel and the Storage of Waste Nuclear Materials.* Report from the Committee of the South Carolina General Assembly to the Governor and General Assembly (1972).

17. *Permanent Storage of Radioactive Separations Process Wastes in Bedrock on the Savannah River Plant Site.* Report by the Consulting Panel convened by Du Pont (May 1969).

18. *A Progress Report of the Panel on Permanent Storage of Radioactive Separations Process Wastes in Bedrock on the Savannah River Plant Site.* Report by the Consulting Panel convened by Du Pont (December 10, 1971).

19. *An Evaluation of the Concept of Storing Radioactive Wastes in Bedrock Below the Savannah River Plant Site.* Report by the Committee on Radioactive Waste Management, NAS-NRC, 1972.

20. *Interim Preliminary Conceptual Analysis Report on the Bedrock Waste Storage Project.* Report by Parsons, Brinkerhoff, Quade, and Douglas, Inc. (July 1972).

21. *Supplement Number 1 to the Interim Preliminary Conceptual Analysis Report on the Bedrock Waste Storage Project.* Report by Parsons, Brinkerhoff, Quade, and Douglas, Inc. (November 1972).

22. *Status Report - Deep Shaft Studies.* Report by Parsons, Brinkerhoff, Quade, and Douglas, Inc. (October 1972).

23. *Triassic Basin Fault Probing Program Report.* Report by Parsons, Brinkerhoff, Quade, and Douglas, Inc. (April 1973).

24. *Bedrock Waste Storage Exploration, Savannah River, S.C.* Draft Environmental Statement, WASH-1511 (January 1972).

25. *AEC Postpones Development of Bedrock Project at Savannah River Plant.* Press Release (November 17, 1972).

26. "Bedrock Waste Storage Exploration, Savannah River, S.C." *Federal Register,* Vol. 37, No. 122, Friday, June 23, 1972.